

FIG.1

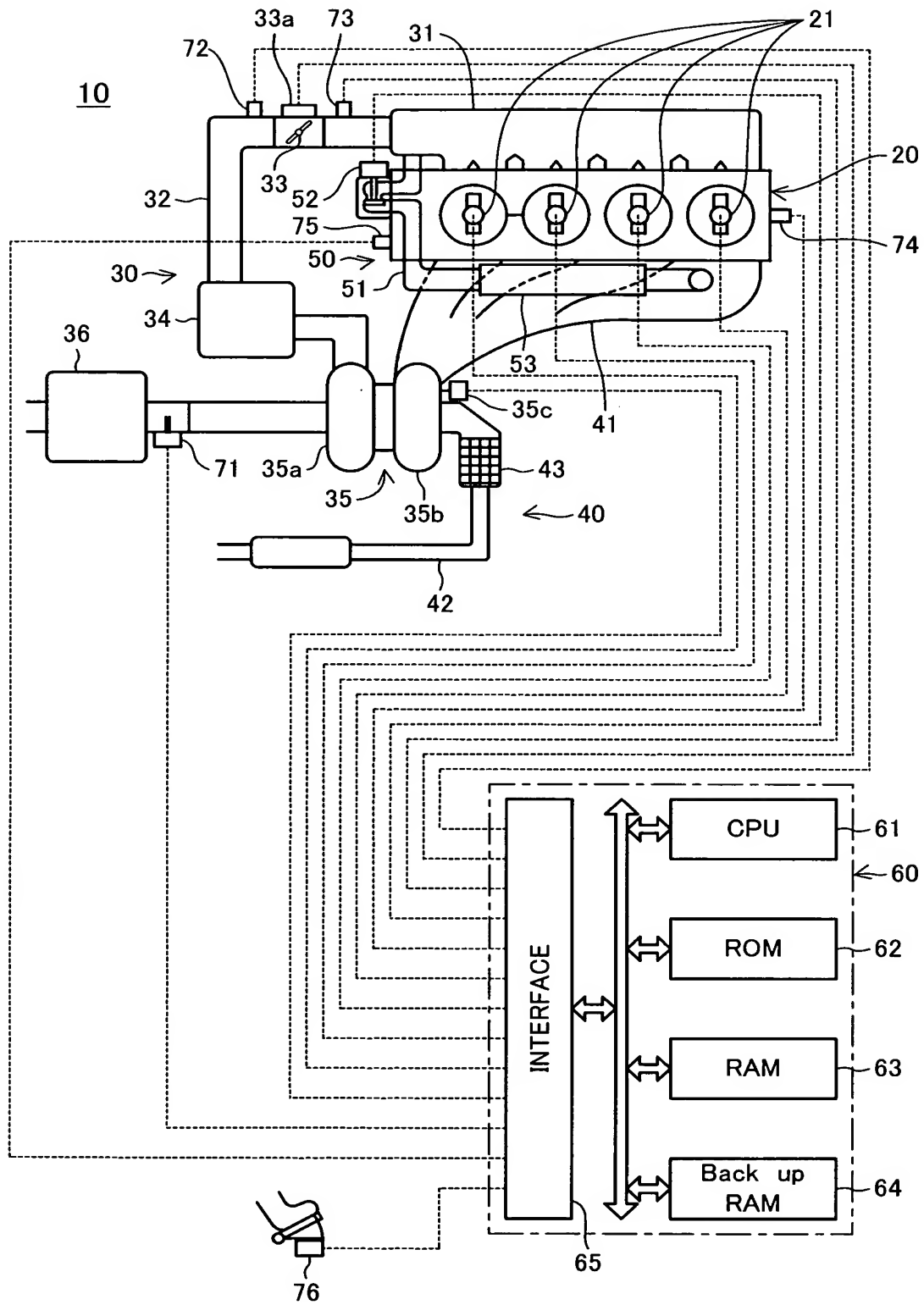


FIG.2A

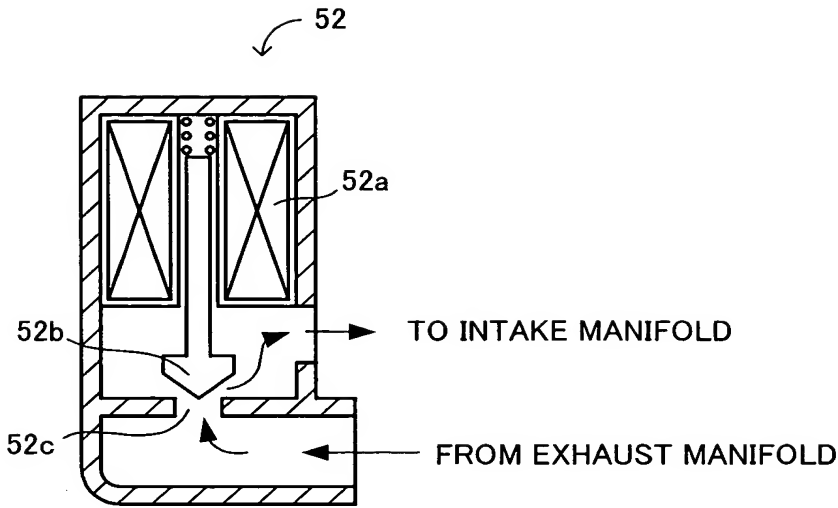


FIG.2B

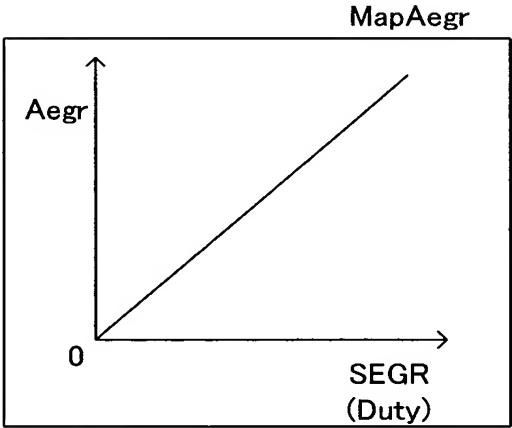


FIG. 3

The diagram illustrates a control system for an internal combustion engine, showing the flow of air and fuel, and the calculation of various parameters. Key components include:

- AIR FLOW METER (71):** Measures air flow G_a .
- INTAKE PRESSURE SENSOR (73):** Measures intake pressure P_b .
- NEW-AIR TEMPERATURE SENSOR:** Measures new-air temperature T_a .
- WATER TEMPERATURE SENSOR:** Measures water temperature THW .
- Block B1:** Calculates $R_{act} = \frac{G_{cyl} - G_{aact}}{G_{cyl}}$.
- Block B2:** Calculates $G_{aact} = \alpha \cdot G_{aact} + (1 - \alpha) \cdot G_a$.
- Block B3:** Calculates $G_{cyl} = \frac{T_{base}}{T_{bout}} (a \cdot P_b + b)$.
- Block B4:** Calculates $T_{bout} = T_{bin} - \eta_{im} \cdot (T_{bin} - T_{wallim})$.
- Block B5:** Calculates $T_{wallim} = f_1 T_{wallim}(THW)$.
- Block B6:** Calculates $\eta_{im} = f \eta_{im}(V_{im}, THW)$.
- Block B7:** Calculates $V_{im} = f V_{im}(G_{all})$.
- Block B8:** Calculates $G_{all} = G_{aact} + G_{egr}$.
- Block B9:** Calculates $G_{egr} = dP_{gain} \cdot fG_{egr}(P_{ex}, P_b, A_{egr})$.
- Block B10:** Calculates $A_{egr} = MapA_{egr}(SEGR)$.
- Block B11:** Calculates $T_{egr} = T_{ex} - \eta_{egr} \cdot (T_{ex} - THW)$.
- Block B12:** Calculates $\eta_{egr} = f \eta_{egr}(G_{egr} / T_{ex})$.
- Block B12a:** Calculates $A_{egr} = MapA_{egr}(SEGR)$.
- Block B13:** Calculates $G_{all} = G_{aact} + G_{egr}$.
- Block B14:** Calculates $T_{wallim} = f_1 T_{wallim}(THW)$.
- Block B15:** Calculates $\eta_{im} = f \eta_{im}(V_{im}, THW)$.
- Block B16:** Calculates $V_{im} = f V_{im}(G_{all})$.

The diagram also shows the flow of air and fuel, and the calculation of various parameters, including G_{aact} , G_{cyl} , G_{egr} , G_{all} , T_{a} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , THW , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , P_{ex} , P_b , A_{egr} , dP_{gain} , fG_{egr} , $f \eta_{egr}$, $f \eta_{im}$, $f V_{im}$, $f_1 T_{wallim}$, $MapA_{egr}$, $SEGR$, THW , T_{base} , T_{bin} , T_{bout} , T_{ex} , T_{egr} , T_{wallim} , V_{im} , <

FIG.4

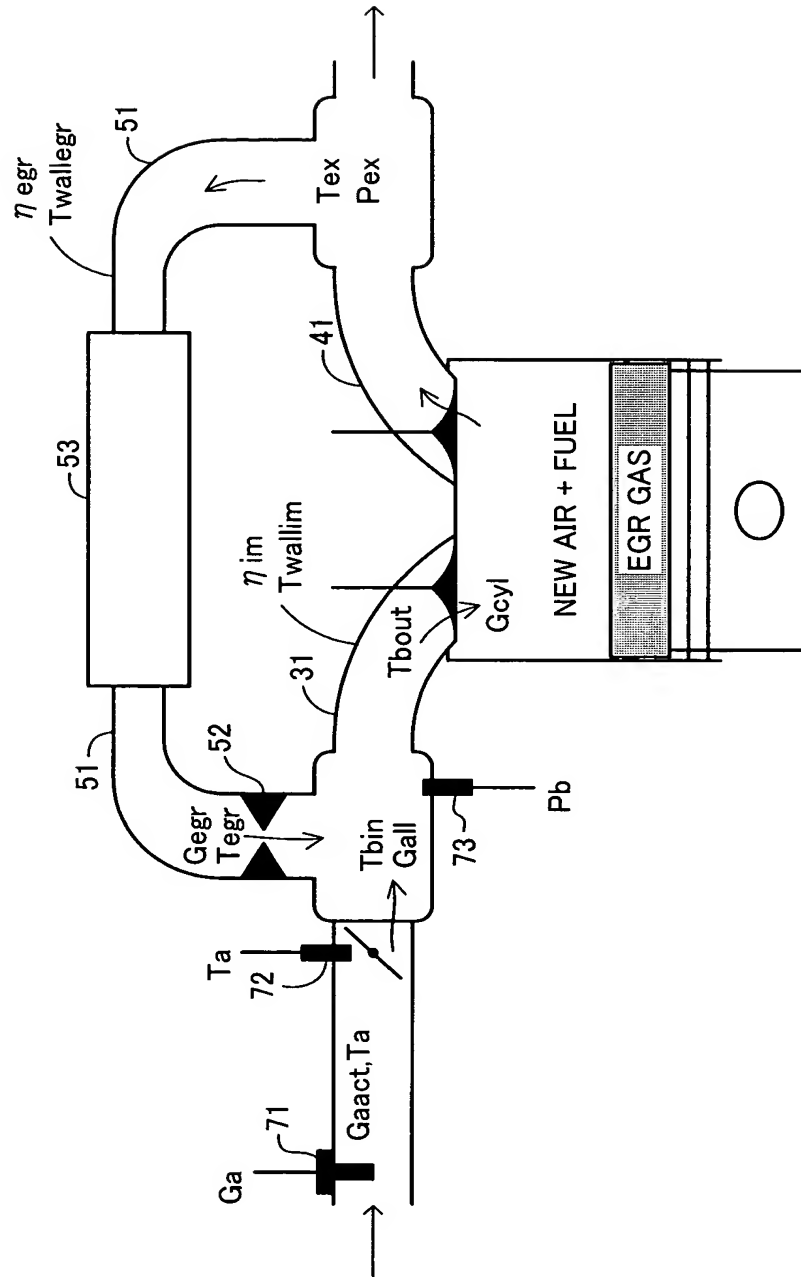


FIG.5

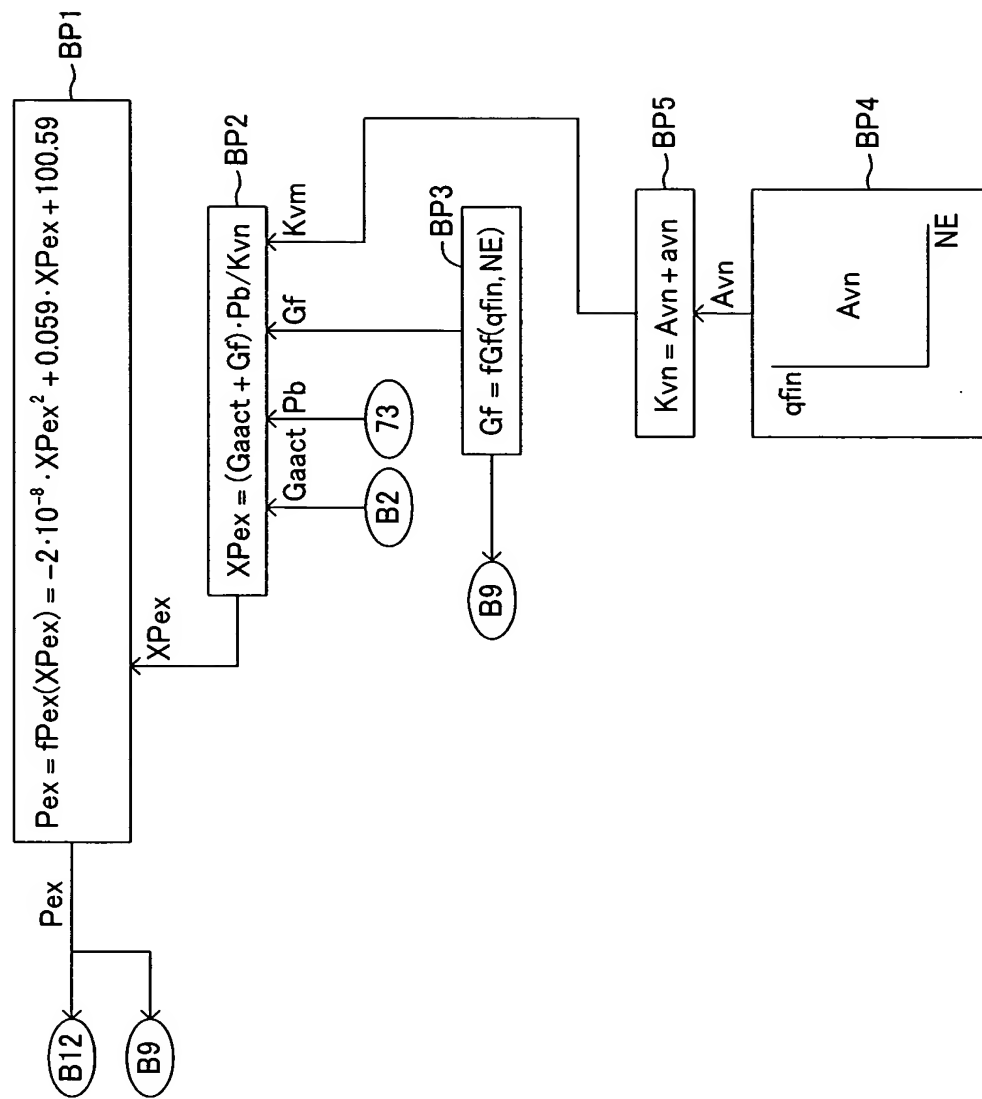


FIG.6

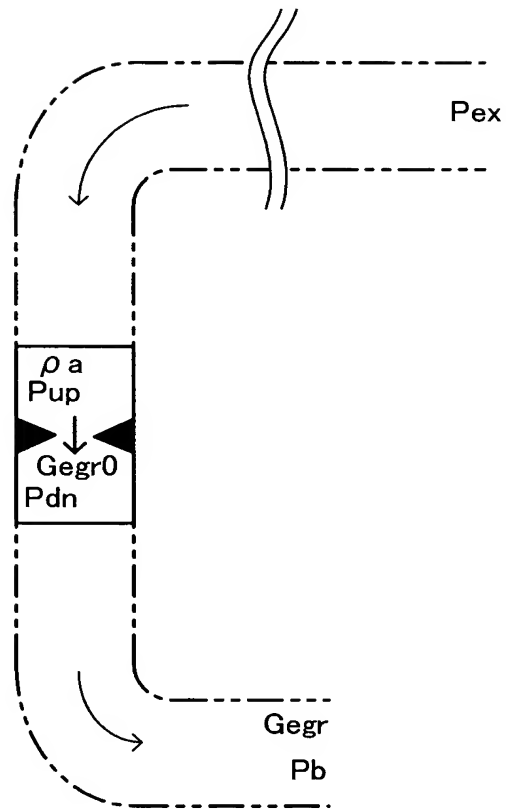


FIG.7

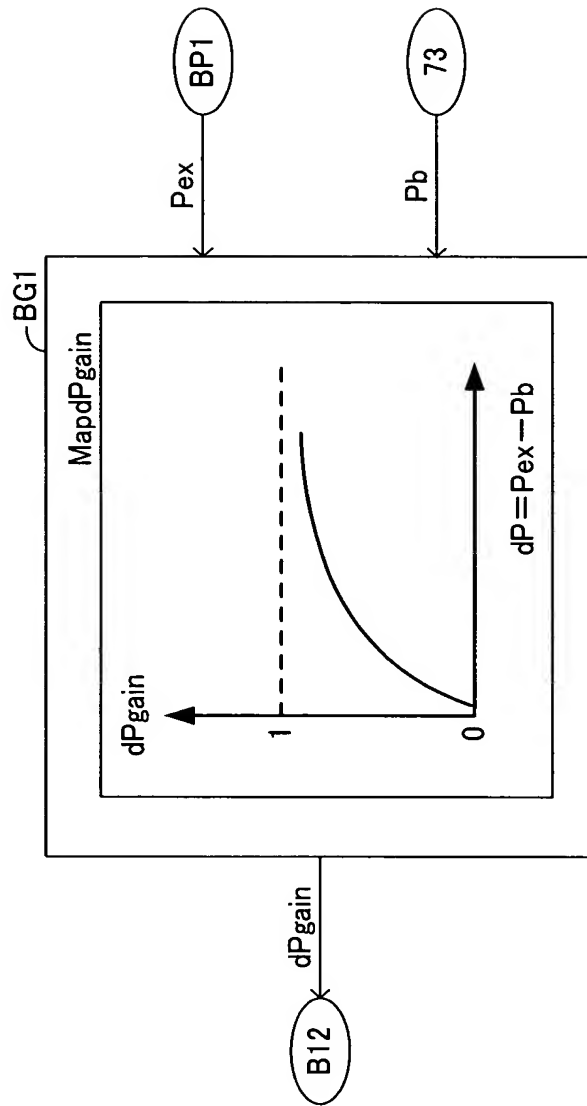
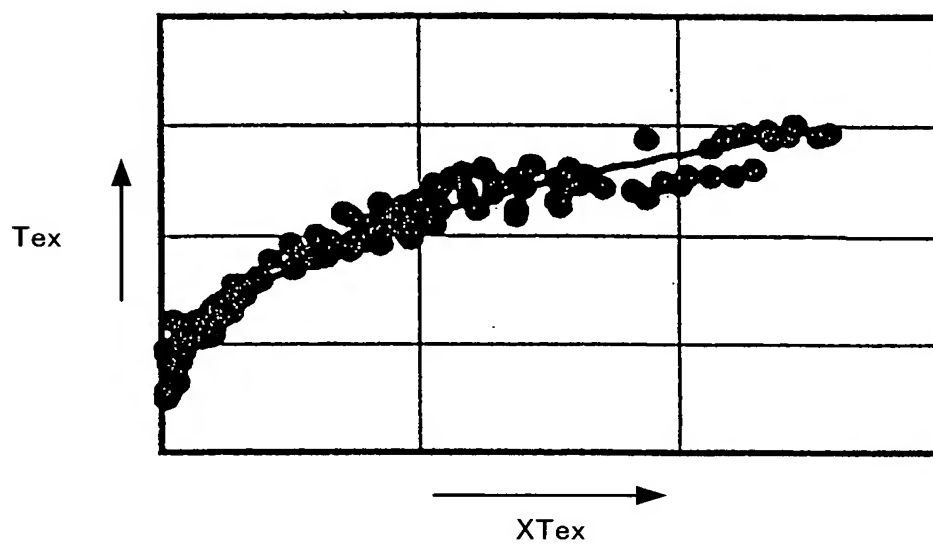
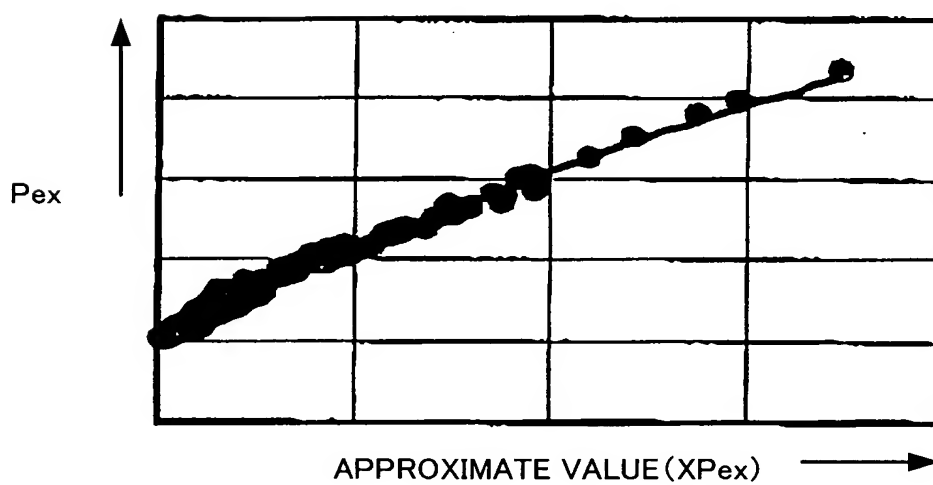


FIG.8



$$Tex = f_{Tex}(XTex) = 545.9XTex^{0.3489}$$

FIG.9



$$Pex = f_{Pex}(XPex) = -2 \cdot 10^{-8} \cdot XPex^2 + 0.0059 \cdot XPex + 100.59$$

FIG.10

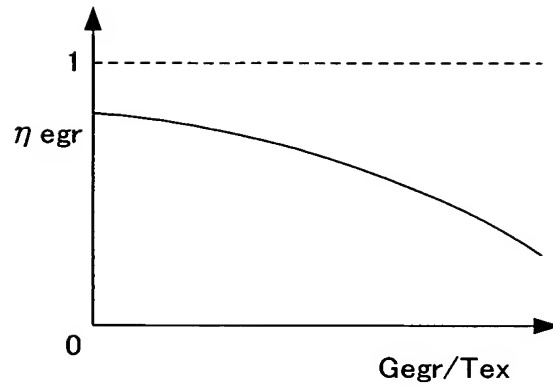


FIG.11

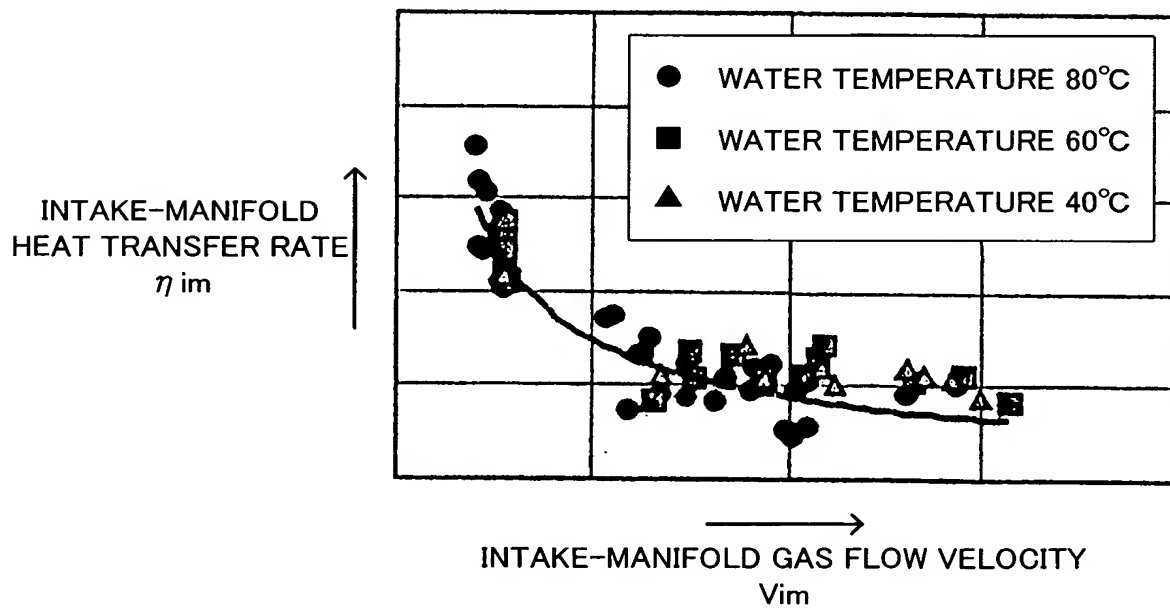


FIG.12

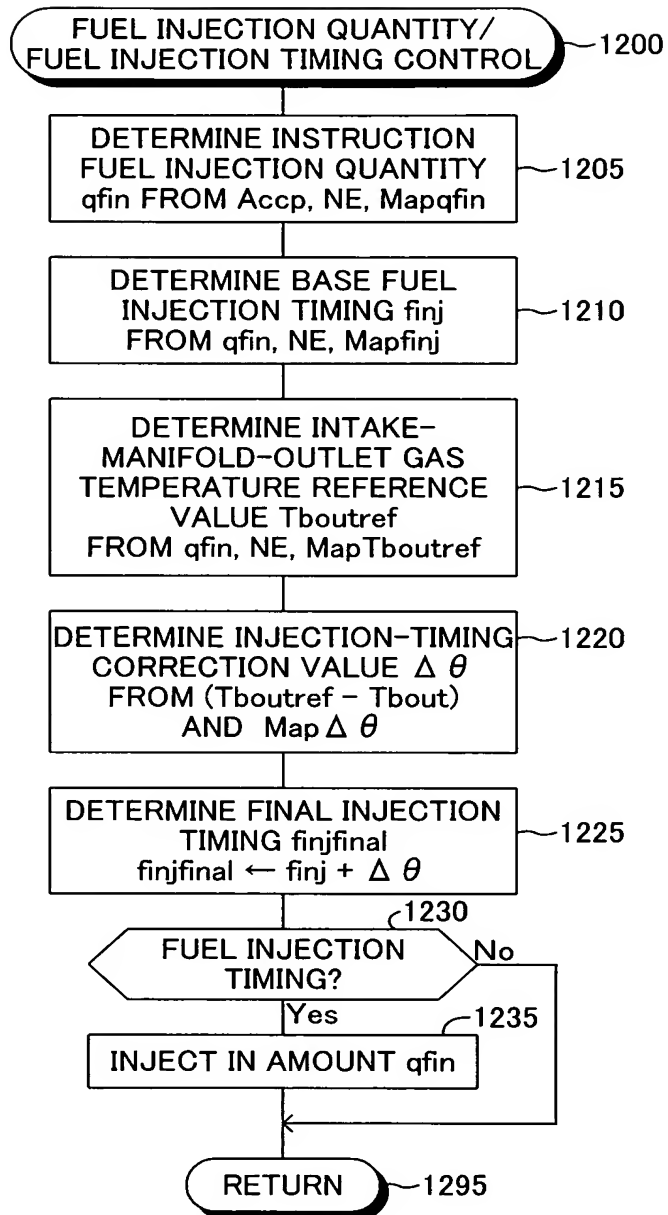


FIG.13

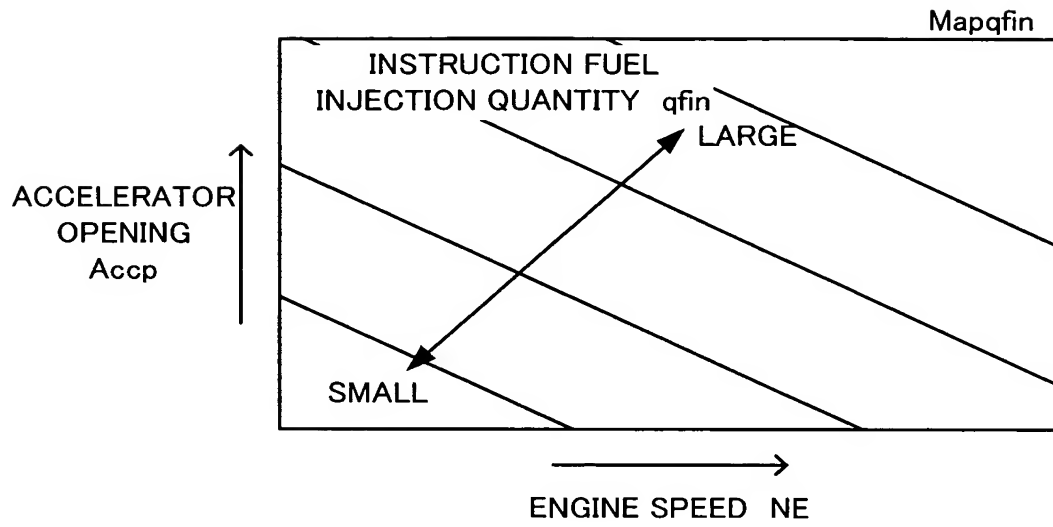


FIG.14

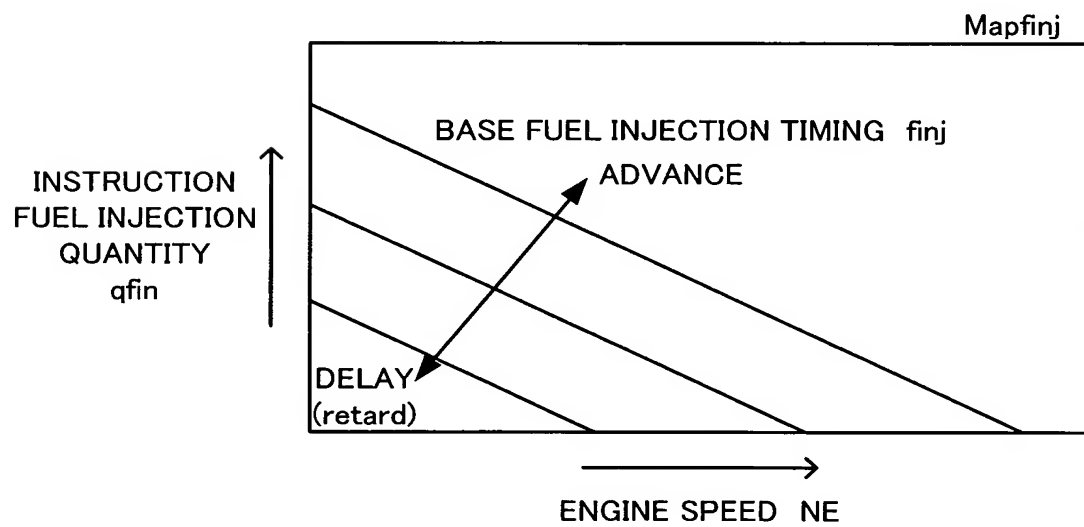


FIG.15

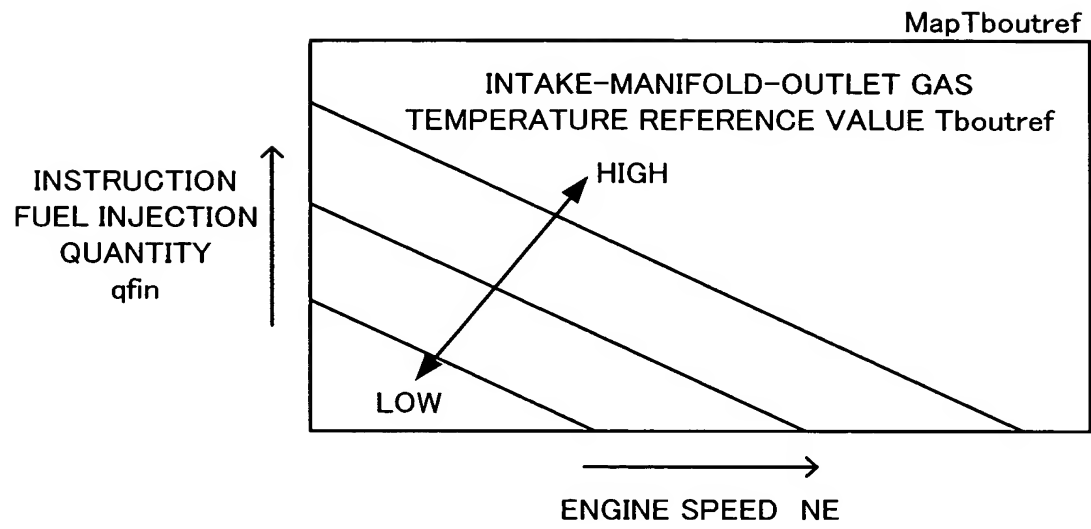


FIG.16

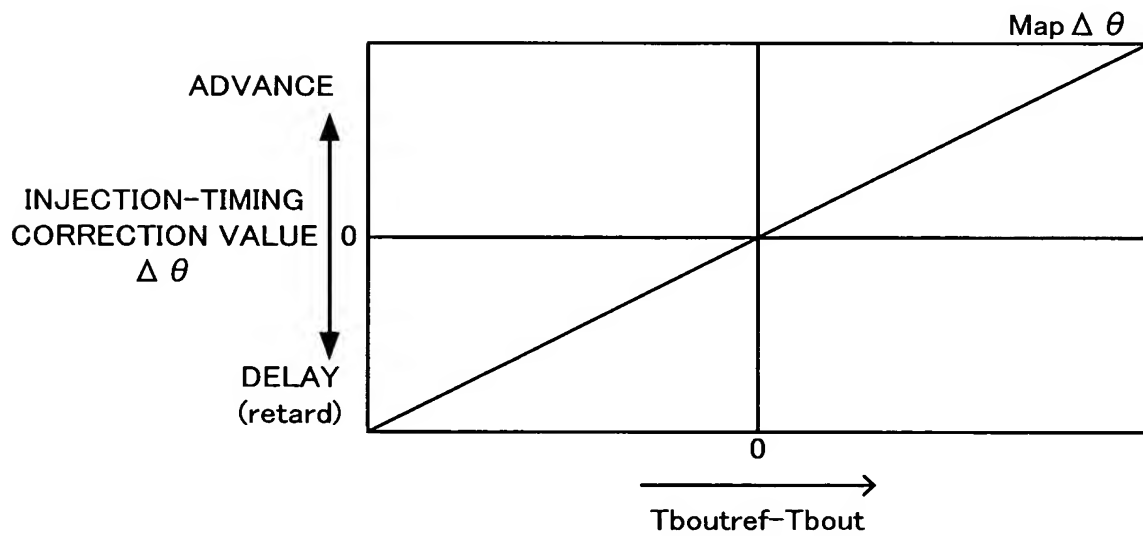


FIG.17

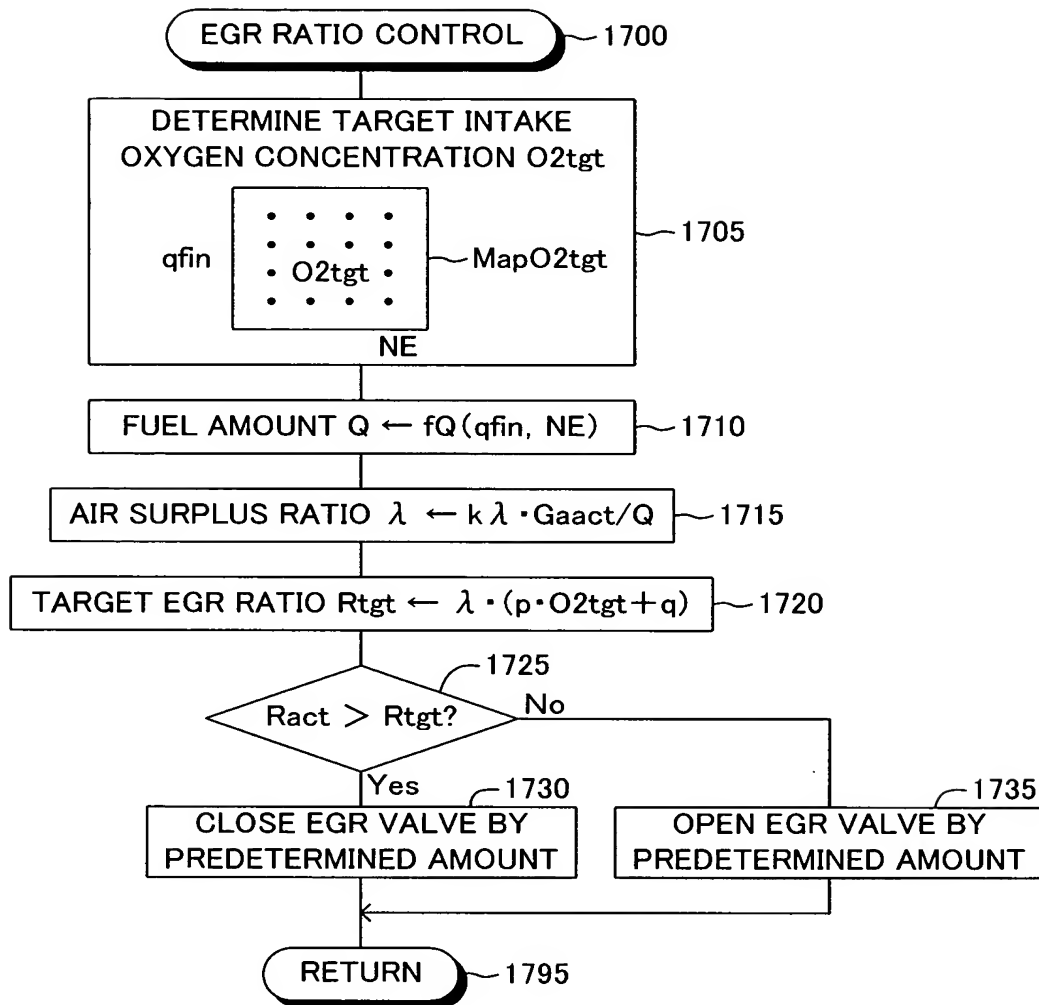


FIG.18

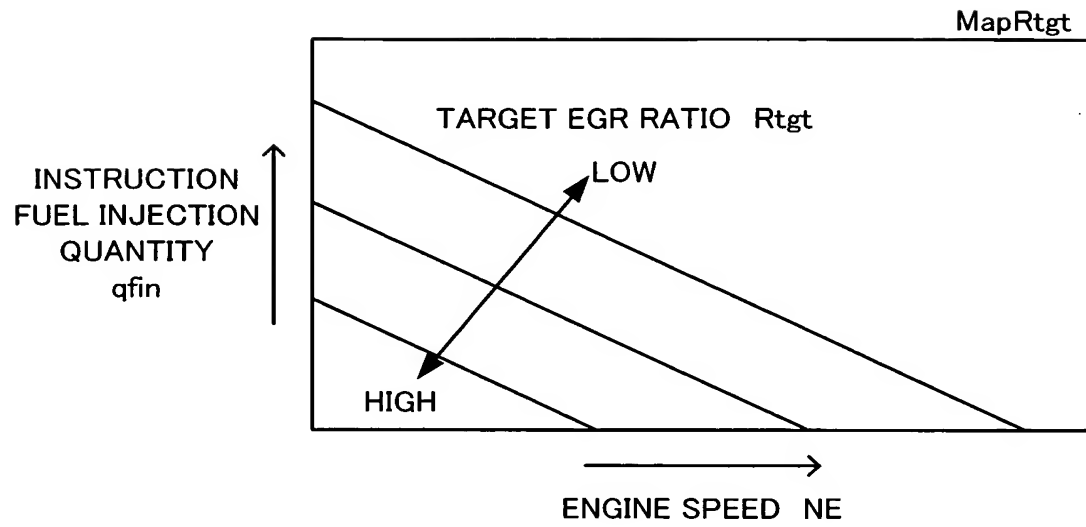


FIG.19

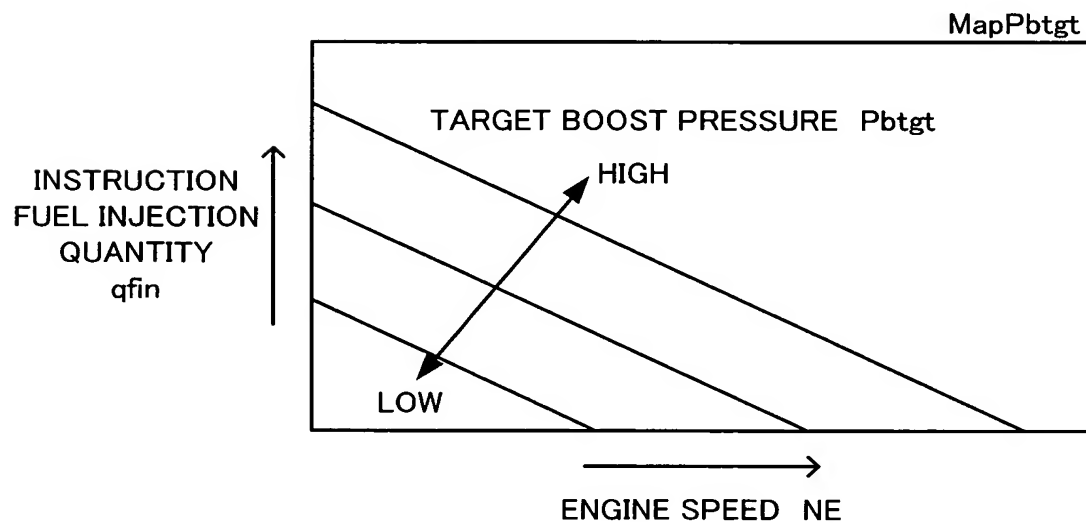


FIG.20

